AMENDMENTS TO THE SPECIFICATION:

Page 1, immediately preceding the paragraph commencing "The present invention relates to a..." insert the following heading and sub-heading:

BACKGROUND

1. Technical Field

Page 1, immediately preceding the paragraph commencing "In recent years,..." insert the following sub-heading:

2. Related Art

Page 2, top of page, insert the following heading:

BRIEF SUMMARY

Page 3, immediately preceding the paragraph commencing "Some embodiments of the invention..." insert the following heading:

BRIEF DESCRIPTION OF THE DRAWINGS

Page 3, immediately preceding the paragraph commencing "Figure 2 shows part of a..." insert the following heading:

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

Pages 3-4, bridging paragraph:

FIG. 2 shows part of a telecommunications system in accordance with a first version of the invention, which is similar to that shown in FIG. 1 in that it ~~utilises~~ utilizes optical fibre from the exchange to the cabinet, ~~whilst~~ while from the cabinet to the subscriber premises, it shares the twisted-pair lines with conventional telephony. In this arrangement, however, the aim is to reduce the amount of electronics installed in the cabinet. In this particular version, the optical fibre is used only for downstream transmission; upstream data transmission (if required) is provided using the copper pairs from the subscriber premises to the exchange, using the same techniques as in a conventional ADSL system, via modulators 30 in the subscriber's data equipment and demodulators 31 in the exchange 1. No multiplexing is employed on the optical fibres 10, so one fibre 10 is provided for each of the subscriber lines 6 that is to be provided with broadband service. No demultiplexers are employed in the cabinets [[4]] 3. Moreover, appropriate modulation for converting digital data into a form suitable for downstream transmission on the twisted pairs 4, 6 is provided by xDSL modulators 32 in the exchange 1. These modulators are conventional and operated in the same manner as the modulator parts of the modems 15 of FIG. 1, using any technique suited to the purpose, for example, discrete multitone (DMT) modulation, or carrierless

amplitude/phase (CAP) modulation. The modulated output of each modulator then modulates a laser 33.

Page 4, 1st, 2nd and 3rd full paragraphs:

In the cabinet [[4]] 3, it is merely necessary to convert the modulated optical signal received over the fibre 10 into electrical form, and apply this signal via a suitable high-pass filter [[34]] 36 to the appropriate pair within one of the cables 4. In this, the simplest implementation of the invention, this conversion is performed by zero-bias PIN photodiodes 35, and then supplied to the cables 4 via high-pass filters [[26]] 36. No power supply to the cabinet is required. Since the frequencies would be low (less than 1 GHz), a large area diode could be used, allowing simple low cost alignment[[,]] and high power operation (typically 0 to +10 dBm).

At the subscriber premises, the downstream signals are received from the splitter/combiner 16 (shown as separate high-pass and low-pass filters 16a, 16b) by an xDSL demodulator [[36]] 37.

Note that it is not necessary that the interface between the fibres 10 and the copper cabling should occur in the cabinet [[4]] 3, as it could equally well occur at the

distribution point 5 or indeed other intermediate location between the exchange and the subscriber's premises.

Page 4, final paragraph:

If one prefers not to provide an upstream data path using copper all the way back to the exchange as envisaged in FIG. 2, then one could use the fibres bidirectionally, as illustrated in FIG. 3. Here the downstream arrangements are as described with reference to FIG. 2, but the subscriber has an xDSL modem [[40]] 42 which is entirely conventional. In the cabinet 3, the upstream signals from the line 4 are fed via a high-pass filter 41 to a laser diode 42 to generate an optical signal which is received by a photodiode 43 at the exchange 1 and supplied to an xDSL modem 44. The high-pass filters [[36,41]] 36, 41 are tuned to the respective parts of the frequency spectrum corresponding to downstream and upstream signals, respectively. Note that, in fact, it is not essential that the equipment 33, 43, 44 be sited at the exchange 1, as they could, if desired, be at some other exchange, or any other location to which the fibres 10 can conveniently be connected.

Page 5, 1st paragraph:

In a yet further modification, in order to reduce the amount of fibre required, some of the above features could be combined with a WDM PON as shown in FIG. 4.

The subscriber has an XDSL modem 40 which is connected to an individual twisted copper pair 4. In the cabinet 3, the upstream electrical signals from the line 4 are fed via a high-pass filter 41 to modulate the optical signal produced by a laser diode 42. The laser diode 42 consists of a Fabry-Perot laser diode which in a free running state would generate light at a series of wavelengths whose wavelength spacing is regular and determined by the properties of the laser diode. The laser diode is arranged so as to ~~predominatly~~ predominantly generate light at one wavelength determined by the wavelength of an optical seed signal which is fed to it, in this example from the exchange 1 ([[See]] see Refs. 1 and 2). For example, FIG. 4 shows light over a broad range of wavelengths being generated by a broadband light source (e.g., erbium doped fibre amplifier) 45 in the exchange 1 and fed via an optical circulator 46 to an optical fibre 10. In the cabinet 3, the optical fibre is connected to a wavelength ~~dependant~~ dependent splitter/combiner 47 such as a thin film filter or arrayed waveguide grating which selects a particular wavelength λ_{LN} and passes it to the laser diode 42. The laser diode then generates light at wavelength λ_{LN} modulated with the upstream data and transmits it via the wavelength ~~dependant~~ dependent splitter/combiner and the optical fibre 10 to the exchange. In the exchange, the optical signal passes via the optical circulator 46 to a second wavelength ~~dependant~~ dependent splitter/combiner 48. The wavelength ~~dependant~~ dependent splitter/combiner 48 is connected to a plurality of photodiodes 43 which each receive light at a particular wavelength (each wavelength

carrying upstream data from a particular customer which is thus supplied to an XDSL modem in the exchange).

Pages 5-6, bridging paragraph:

In the downstream direction, a second broadband light source 49 generates light [[at]] over a different band of wavelengths to the first light source 45. For example, if the first and second broadband light sources 45 and 49 were erbium [[dopes]] doped fibre amplifiers, then one could supply wavelengths in the so called "C-band" and the other in the so called ~~"L-band"[of~~ "L-band" [of an ITU standard]. The broadband light source 49 is connected via an optical circulator 50 and a further wavelength ~~dependant~~ dependent splitter/combiner 51 to a set of laser diodes 52, which again consist of Fabry Perot laser diodes. In this way, each of the laser diodes 52 generates light at a different wavelength depending upon which port on the wavelength ~~dependant~~ dependent splitter/combiner it is connected to. Each of the laser diodes 52 is modulated with the downstream output from one 321, 322 of a set of XDSL modulators in the exchange 32. The modulated downstream optical signals from the laser diodes 52 pass from the exchange along the optical fibre to the cabinet 3. Simple 1×2 WDM optical wavelength band splitter/combiner filters 53 and 54 allow the optical signals produced by each of the two broadband light sources to share the same single optical fibre. The transmission of the wavelength ~~dependant~~ dependent splitter/combiner 47 as a function

of wavelength is periodic such that the upstream and downstream data for a particular customer propagate along the same optical fibre. On arriving at the cabinet 3, the modulated downstream optical signals are passed by the wavelength ~~dependant~~ dependent splitter/combiner 47 to a device, such as a zero-bias PIN photodiode 35, which converts the signal to an electrical form and applies it via a suitable high pass filter 26 to the appropriate twisted copper pair 4 for the customer. Optionally, the laser diodes 42 and photodiodes 35 located in the cabinet could be fed with a low level of dc power from the subscriber premises or exchange over the or a copper pair. It is not necessary for the interface between the fibres 10 and copper cabling to occur in the cabinet 3 as this could equally occur at the distribution point 5 or indeed other intermediate location between the exchange and the subscriber's premises. Furthermore, the broadband light sources (e.g., 49) and laser diodes (e.g., 52) in the exchange could alternatively be replaced by a set of wavelength specified DFB lasers.

Pages 6-7, bridging paragraph:

A modification of part of the system of FIG. 2 is shown in FIG. 5 (like components are given like numerals). Here, the lasers 33 are configured to transmit at different respective carrier frequencies. A wavelength division multiplexer [[33]] 331, at the exchange, is arranged to receive the signals from the respective lasers, and to transmit the signals as a wavelength division multiplexed signal over a common link, for

example, a common fibre 101. A corresponding wavelength division demultiplexer 332 at the cabinet 3 receives the wavelength division multiplexed signal from the common fibre 101 and ~~demuliplexes~~ demultiplexes the signal. The ~~demuliplexed~~ demultiplexed optical signals are then passed to respective photodiodes 35, which photodiodes provide respective electrical signals to xDSL demodulators 36, in a similar fashion to that shown in FIG. 2. In this way, multiplexing the signals between the exchange 1 and the interface 3 reduces the number of optical fibres required between the exchange and the interface.

Page 8, top of page, delete "CLAIMS" and insert the following heading:

WHAT IS CLAIMED IS: